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09/759,962	01/12/2001	Jawahar M. Gidwani	22122878-temp	1684
26453	7590	05/19/2005	EXAMINER	
BAKER & MCKENZIE LLP 805 THIRD AVENUE - 29TH FLOOR NEW YORK, NY 10022			PHAM, THOMAS K	
			ART UNIT	PAPER NUMBER
			2121	
DATE MAILED: 05/19/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/759,962

Applicant(s)

GIDWANI, JAWAHAR M.

Examiner

Thomas K. Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 April 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All   b) ☐ Some \*   c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

*Response to Amendment*

1. This action is in response to RCE filed on 04/15/2005.
2. Claims 1-23 have presented for examination.

**Quotations of U.S. Code Title 35**

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

### **Claim Rejections - 35 USC § 102**

7. Claims 1 and 23 are rejected under 35 U.S.C. 102(b) as being unpatentable over U.S. Patent No. 5,388,056 ("Horiuchi")

#### **Regarding claims 1 and 23**

Horiuchi teaches a computer-implemented method for analyzing a structure comprising:

- receiving linear elastic input data of a structure defined from a structure plan without requiring a physical presence of the structure [fig. 22 and col. 13 line 64 to col. 14 line 8. *It should be noted that Examiner is considering the limitation "defined from a structure plan without requiring a physical presence of the structure" with little or no patentable weight because the purpose of having a physical structure is only for providing data to the analyzing computer. The physical structure itself is not part of the computer for analyzing a structure*];
- automatically determining non-linear input data based on the received linear elastic input data [col. 6 lines 45-53, *Examiner interprets that the digital computer automatically process the data as it entered.*];
- analyzing the determined non-linear input data through a non-linear analysis technique [col. 7 line 3 to col. 9 line 31] ; and
- outputting the result of analysis [col. 13 lines 51-55].

8. Claim 16 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,842,148 ("Prendergast").

#### **Regarding claim 16**

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Prendergast teaches a computer-implemented method for analyzing a structure comprising:

- classifying a plurality of structures according to predetermined structure types [col. 2 lines 4-8] defined from a structure plan without requiring a physical presence of the structure [col. 5 lines 25-35, *It should be noted that Examiner is considering the limitation "defined from a structure plan without requiring a physical presence of the structure" with little or no patentable weight because the purpose of having a physical structure is only for providing data to the analyzing computer. The physical structure itself is not part of the computer for analyzing a structure.*];
- sub-classifying the structures within each classified structure type by fundamental structure periods [col. 2 lines 4-8];
- determining damage functions for the sub-classified structures [col. 6 lines 59-65]; and storing the determined damage functions [col. 2 lines 29-34].

### **Claim Rejections - 35 USC § 103**

9. Claims 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi in view of "Modeling of cyclic shear behavior in RC Members" by D'Ambrisi et al. (hereinafter D'Ambrisi).

#### **Regarding claim 5**

Horiuchi does not teaches analyzing includes using a minimization technique to minimize the storage requirements of a global stiffness matrix and local stiffness matrix. However, D'Ambrisi teaches the flexibility matrices are used in calculation of the stiffness matrices  $K_m$  in local coordinates and global coordinates [see page 1146-1147 "ELEMENT STIFFNESS MATRIX"]

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for the purpose of simulating the nonlinear static and dynamic response of reinforced concretes frames. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the stiffness matrices of D'Ambrisi with the system of Horiuchi because it would provide for the purpose of simulating the nonlinear static and dynamic response of reinforced concretes frames [see D'Ambrisi abstract].

**Regarding claim 6**

D'Ambrisi teaches analyzing includes using a numerical solution technique that requires only one copy of a global stiffness matrix [see page 1146-1147 "ELEMENT STIFFNESS MATRIX"].

**Regarding claim 7**

D'Ambrisi teaches reformulating and reducing only a portion of a global stiffness matrix that changes due to change in member state or large displacement effects [see page 1146-1147 "ELEMENT STIFFNESS MATRIX"].

**Regarding claim 8**

D'Ambrisi teaches analyzing includes using a sufficiently higher order integration method to increase the step size thereby reducing the number of steps required for analysis [see page 1147 "CORRELATION WITH EXPERIMENTAL RESULTS"].

**Regarding claim 9**

Horiuchi does not teaches analyzing includes: using a minimization technique to minimize the storage requirements of a global stiffness matrix and local stiffness matrix; using a numerical solution technique that requires only one copy of the global stiffness matrix; reformulating and reducing only a portion of a global stiffness matrix that changes due to change in member state;

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and using a sufficiently higher order integration method to increase the step size thereby reducing the number of steps required for analysis. However, D'Ambrisi teaches the flexibility matrices are used in calculation of the stiffness matrices  $K_m$  in local coordinates and global coordinates [see page 1146-1147 "ELEMENT STIFFNESS MATRIX"] and implementing a computer program for the nonlinear static and dynamic analysis of reinforced concrete structures [see page 1147 "CORRELATION WITH EXPERIMENTAL RESULTS"] for the purpose of simulating the nonlinear static and dynamic response of reinforced concretes frames. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the stiffness matrices of D'Ambrisi with the system of Horiuchi because it would provide for the purpose of simulating the nonlinear static and dynamic response of reinforced concretes frames [see D'Ambrisi abstract].

10. Claims 2-4, 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi in view of U.S. Patent No. 6,412,237 ("Sahai").

**Regarding claim 2**

Horiuchi teaches a computer-implemented method for analyzing a structure but does not teach determining a static load pushover profile for use in a static load pushover analysis. However, Sahai teaches determining a static load pushover profile for use in a static load pushover analysis (col. 10 col. 1-10, "Specific analyses include ... of the earthquake criteria"). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to incorporate the Static Pushover analysis of Sahai with the computer method of Horiuchi because it would provide for clearly depicting step by step the behavior of the inelastic response of the frame.

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**Regarding claim 3**

Horiuchi teaches automatically determining non-linear input data but does not include automatically determining the envelope behavior, degradation behavior, and failure behavior of members of the structure based on previously determined models of the members and the received linear elastic input data. However, Sahai teaches using standard commercial software programs for automatically determining the deflections, stresses, elastic behavior in the structural frame based on previous models (col. 9 line 63 to col. 10 line 10). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to incorporate the automatic computer analysis of Sahai with the computer method of Horiuchi because it would provide for clearly depicting step by step the behavior of the inelastic response of the frame.

**Regarding claim 4**

Horiuchi teaches at least a part of the data for the previously determined models is based on experimental or empirical data, and each model is stored as a plurality of data points, a mathematical representation, or both (col. 4 lines 21-31, "Effective evaluation of the results ... after completion of the test").

**Regarding claim 10**

Sahai teaches displaying a summary of inelastic sequence of events for damaged members of the structure (col. 13 lines 51-55, "FIG. 21 shows ... via the D/A converter 6").

**Regarding claim 11**

Sahai teaches the summary includes global, regional, and local damage measures (table 1).

**Regarding claim 12**



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Sahai teaches the global damage measure includes global displacement ductility and number of damaged members, the regional damage measure includes one or more of inter-story drifts, inter-story shears, number of damaged members in the region, and identification of damaged members, and the local damage measure includes maximum member ductilities, cumulative member ductilities and number of cycle reversals (col. 11 lines 6-30, "While the frame is ... other 3% damping").

**Regarding claim 13**

Horiuchi and Sahai do not teach outputting includes outputting a color-coded image of the structure showing different levels of damage to the members of the structure. However, it would have been obvious to one of ordinary skill in the art at the time the invention that color-coding them identifies different levels of damages much easier, as it is known in the art of blue print and building design.

11. Claims 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Prendergast in view of Sahai.

**Regarding claim 17**

Sahai teaches determining non-structural damage functions corresponding to the structural damage functions (col. 11 lines 25-30, "Generally this is ... the other 3% damping").

**Regarding claim 18**

Sahai teaches classifying the plurality of structures according to either FEMA guidelines or building code guidelines (col. 11 lines 15-17, "for the structure ... document FEMA-273").

**Regarding claim 19**

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Prendergast teaches sub-classifying as similar structures all structures within a classified structure type whose fundamental structure period falls within a predetermined range (col. 3 lines 57-62, “The structural characteristics ... associated with damage”).

**Regarding claim 20**

Prendergast teaches receiving location and other data of a first structure, identifying among the plurality of classified structures one classified structure that corresponds to the first structure, and retrieving the stored damage function of a sub-classified structure that corresponds to the identified structure for analysis of the first structure (col. 6 lines 16-56, “Wood frame, one to ... and/or wind database 36”).

**Regarding claim 21**

Prendergast teaches determining a fault that likely causes damage to the first structure, determining at least one spectral acceleration of the determined fault line to the structure, and determining a damage measure for the determined spectral acceleration from the retrieved damage function (col. 5 line 62 to col. 6 line 16, “It is generally accepted ... when evaluating risk”).

**Regarding claim 22**

Prendergast teaches determining damage functions of a plurality of previous disasters; and calculating a mean damage function from the determined damage functions by regression (col. 6 lines 25-28, “Damage to a specific ... in the past”).

12. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horiuchi in view of U.S. Patent No. 5,842,148 (“Prendergast”).

**Regarding claim 14**

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Horiuchi teaches a computer-implemented method for analyzing a structure but does not teach repeating the analyzing step for each of a plurality of intensities or probabilities of a preselected catastrophic load; and displaying the number of damage measures as a function of the intensities or probabilities of the preselected catastrophic load. However, Prendergast teaches a probabilistic program is used to evaluate a number of parameters in determining the relative risk of damage to the structure (col. 5 lines 47-60, "USQUAKE, and similar ... for a wind related analysis"). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to incorporate the probabilistic analysis of Prendergast with the computer method of Horiuchi because it would provide for estimating the damages caused to the structure and how similar structures performed in the past.

**Regarding claim 15**

Prendergast teaches using the damage measures to assess monetary losses or to make a financial or mitigation decision (col. 6 line 66 to col. 7 line 2, "The rating and report ... lower insurance rates").

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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner *Thomas Pham*; whose telephone number is (571) 272-3689, Monday - Thursday from 6:30 AM - 5:00 PM EST or contact Supervisor *Mr. Anthony Knight* at (571) 272-3687.

Any response to this office action should be mailed to: **Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450**. Responses may also be faxed to the **official fax number (703) 872- 9306**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Thomas Pham**  
*Patent Examiner*

  
May 13, 2005

  
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